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EXAMINER
LE, LANA N

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Please find below and/or attached an Office communication concerning this application or proceeding.

N.K

Office Action Summary	Application No. 09/400,974	Applicant(s) SATO ET AL.	
	Examiner Lana Le	Art Unit 2684	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *31 December 2002* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-40* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-40* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 12/31/02 have been fully considered but they are not persuasive.

Even though the millimeter band operates at microwave frequencies within the extra high frequency band (EHF, 30GHz to 300 GHz) band, the band merely broadens the limits or boundaries within the continuous radio frequency spectrum, only needing certain hardware/circuitry such as an arrayed beam steering antenna or high-gain directional antennae for tracking the signal in which antenna system such as the multi-band polarization diversified antenna that different frequency bands can be used for the antenna system which can accommodate a plurality of antenna subsystems such as low band, millimeter band, etc. and filtering. However, how the signals are received simultaneously are not claimed and clearly defined. Therefore, with or without the hardware/circuitry/antenna which was not claimed that the signals are received simultaneously without it, the signals can be received simultaneously at the receiving arrayed antenna.

The millimeter band is merely for intended use, i.e. commercial use in which it is applicable with continuous wireless spectrum, from very low frequency band... to high frequency band.. to very high frequency band, ultra high frequency band... and to extra high frequency band in which the spectrum is widened to include extra high frequencies in the millimetre band for commercial use purposes. Since millimeter waves provide a

relative amount of spectrum bandwidth margin, the utilization efficiency on the frequency axis is not as severe as with previous microwaves. Due to the continuous spectrum, the calculation/algorithm is the same, with only differences in simplification of hardware/circuitry. One of ordinary skill in the art would have appreciated that the difference would not have involved any inventive concept of the claimed subject matter since it would have purely depended on the desired performance or the available spectrum resource of the system.

Regarding dependent claims 2, 3, 7, 8, 14, 33 and 35, applicant alleges that Brunner does not disclose a reflector. However, the reflected signal 1 couldn't have been reflected if there wasn't a reflector (top block represented by a dashed bar), the claimed language of "arranging a reflector to reflect a millimeter signal and direct the reflected signal to the receiver" is merely a choice of measuring the signal from an intended angle or direction with a certain distance from the transmitter which will become in contact with surrounding reflectors which could be arranged in order to measure the reflected signals.

Regarding claims 15-17 and 36, the millimeter band signals belong to a continuous spectrum which for intended commercial use which was discussed above, the spatial filter is not claimed to be not used or not included as part of the simultaneous reception in the independent or dependent claims and is therefore irrelevant whether or not that part of circuitry is involved, the fact that simultaneous reception is possible at the receiver is all that is considered to be relevant to the claims.

Regarding claims dependent 16, 17, and 36, the claimed language of "arranging a reflector on the surface of the component" is merely for the purpose as discussed in claims 2, 3, 7, 8, 14, 33 and 35 above in which "arranging a reflector to reflect a millimeter signal and direct the reflected signal to the receiver" is merely a choice of measuring the signal from an intended angle or direction with a certain distance from the transmitter which will become in contact with surrounding reflectors which could be arranged in order to measure the reflected signals in which Freeburg's reflectors could be placed at their different positions to measure and detect the intended reflected signals accurately.

Regarding claims 18-26, 31, 32, and 34, applicant further alleges that Lewiner does not teach "the receiver receiving a plurality of propagation paths except said line of sight propagation path". Lewiner's disclosure teaches the signals are received via the indirect paths and not the direct path. Therefore, any other argument regarding the "obstruction state" is irrelevant to the claimed language.

Regarding claims 4-6, applicant alleges that aluminum is a material that Freeburg doesn't have. However, applicant admits that the specification disclose "alternative materials have been found to provide suitable reflection". Therefore, even if aluminum is not used, it would have been obvious to one of ordinary skill in the art at the time the invention was made to replace it with any other material that is capable of reflecting the signals well without penetrating and that aluminum is not in any way an essential element in applicant's invention. Also, any object, i.e. utilities to cover food, etc. in a building such as one in Freeburg can be used as a reflector in the indirect path.

Therefore, aluminum is merely one type of material out of many alternative materials that can be substituted for the reflector's surface and therefore is not an essential utility/element in applicant's invention.

Regarding claim 9, it is alleged that Freeburg does not have the transmitter at a prescribed transmission angle or distance. However, by merely placing the transmitter at a certain position, and measuring the intended signals and the distance will suggest the transmitter transmits at a prescribed distance and transmission angle.

Regarding claims 12 and 13, Kagami does disclose a common oscillator between a plurality of transmitters and applicant's argument is not persuasive. The motivation for the 103 rejection's combination has been clarified further.

Regarding claims 8 and 14, applicant alleges that the signals are not always received simultaneously, however, the multiple-arrayed antenna, in which the claim did not explicitly state that such antenna is not a possible antenna, is equipped with the capability to receive signals simultaneously, even if the signals are always received simultaneously.

Regarding claims 25-26, art has been applied to support the official notice of the two millimeter wave transmitters.

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

The term "millimeter band" in claims 1-40 is a relative term which renders the claim indefinite. The term "millimeter band" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. The specification does not provide enough support for the millimeter band signal.

2. Claims 1-40 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The simultaneous reception of the two signals is not clearly defined on how the signals are received simultaneously.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1-3, 7-8, 11, 14, 33, and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brunner et al (US 6,301,470) in view of Hayashikura et al (US 5,654,715).

Regarding claim 1, Brunner et al discloses a signal transmitting/ receiving system (col 6, lines 50-63; Fig. 2 and hereafter),

comprising a transmitter MS1 transmitting a signal wave;

a propagation path forming portion forming at least one indirect propagation path 1 from MS1 towards the ceiling and to the receiver 6 for propagation of the RF band signal wave;

a receiver capable of receiving simultaneously a plurality of the signal waves from a plurality of propagation paths including a line of sight propagation path (see LOS path 1) and the at least one indirect propagation path, and receiving the signal wave from at least one of the plurality of propagation paths (col 5, lines 20-25; col 4, lines 56-65). Brunner et al didn't disclose a millimeter band signal transmitting/receiving system, and a millimeter band propagation signal, transmitting and receiving a millimeter band signal wave. Hayashikura et al discloses a millimeter band signal transmitting/receiving system, and a millimeter band propagation signal, transmitting and receiving a millimeter band signal wave (col 2, lines 7-18; col 3, lines 60-67). It would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute the high frequency band signal of Brunner with the millimeter band signal in order to fully utilize the continuous spectrum by broadening the intended use of the signal wave for commercial purposes merely by using an alternative frequency in a

higher frequency band than usual depending on the available spectrum resource of the system.

Regarding claim 2, Brunner et al and Hayashikura et al discloses the millimeter band signal transmitting/receiving system according to claim 1, wherein Brunner et al further discloses the propagation path forming portion includes a reflector (ceiling) arranged to reflect the signal wave transmitted from the transmitter and direct the reflected signal wave to the receiver 30 (fig. 2).

Regarding claim 3, Brunner et al and Hayashikura et al discloses the millimeter band signal transmitting /receiving system according to claim 2, wherein Brunner et al further discloses the reflector (ceiling) is arranged substantially almost in parallel to a line of sight 1 directly to 30 from MS1 between the transmitter and the receiver (fig 2).

Regarding claim 7, Brunner et al and Hayashikura et al discloses the millimeter band signal transmitting/receiving system according to claim 2, wherein Brunner et al further discloses a plurality of the reflectors (block on the right and bottom of MS1) are arranged to form the plurality of propagation paths for propagating the signal waves to the receiver (fig. 2).

Regarding claim 8, Brunner et al and Hayashikura et al discloses the millimeter band signal transmitting/receiving system according to claim 1, wherein Brunner et al further discloses the receiver 30 always simultaneously receives the plurality of signal waves 1 from the plurality of propagation paths in a normal state (fig. 2).

Regarding claim 11, Brunner et al and Hayashikura et al discloses a signal transmitting/receiving system, comprising a plurality of transmitters MS1 and MS2 and

for and a receiver 30 arranged to simultaneously receive a plurality of signal waves output from the plurality of transmitters, the plurality of millimeter band signal waves transmitted from the plurality of transmitters having a same frequency (col 4, lines 54-57). It would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute the high frequency band of Brunner with the millimeter band of Hayashikura et al in order to obtain microwave and above frequencies in the same continuous wireless radio frequency spectrum for more practical applications, i.e. local multipoint distribution services, commercial services which serves as intended use purposes.

Brunner didn't specifically discloses the millimeter band signal transmitting/receiving system; a receiver arranged to receive millimeter band signal wave and the plurality of millimeter band signal waves transmitted from the plurality of transmitters (col 2, lines 7-18; col 3, lines 55-67). It would have been obvious to one of ordinary skill in the art at the time the invention was made to

Regarding claim 14, Brunner et al and Hayashikura et al discloses the millimeter band signal transmitting/receiving system according to claim 11, wherein Brunner et al further discloses the receiver always simultaneously receives the plurality of signal waves in a normal state.

Regarding claim 33, Brunner et al and Hayashikura et al discloses the millimeter band signal transmitting/ receiving system of claim 1, wherein Brunner et al further discloses the receiver 30 receives the signal wave through the line of sight propagation

path 1 when the line of sight propagation path is not blocked from MS1 directly to receiver 30 (fig. 1).

Regarding claim 35, Brunner et al and Hayashikura et al discloses the millimeter band signal transmitting/ receiving system of claim 11, wherein Brunner et al further discloses the receiver 30 receives one of the plurality of signal waves through at least one line of sight propagation path 1 from MS1 directly to 30 between at least one of the plurality of transmitters MS1 and MS2 and the receiver (Fig. 2).

5. Claims 18-26, 31-32, and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brunner et al (US 6,301,470) in view of Hayashikura et al (US 5,654,715) and further in view of Lewiner et al (US 5,926,768).

Regarding claim 18, Brunner et al discloses a radio frequency signal transmitting/receiving system, comprising: at least one transmitter transmitting a signal through an associated transmit antenna along a plurality of propagation paths 1 of the signal formed by the associated transmit antenna including a line of sight propagation path between the associated transmit antenna and a receive antenna (col 5, lines 20-25; col 4, lines 56-65); a receiver 30 receiving the signal through the receive antenna, wherein, in a normal state when the line of sight propagation path is unobstructed (see direct path 1 from MS1 to 30), the receiver receives the signal through each of the plurality of propagation paths 1 including the line of sight propagation path (fig. 2),

Brunner didn't disclose a millimeter band transmitting/receiving system; a transmitter transmitting a millimeter band signal; and a receiver receiving a millimeter

signal. Hayashikura et al discloses a millimeter band transmitting/receiving system; a transmitter transmitting a millimeter band signal; and a receiver receiving a reflected millimeter signal in the obstructed state (col 3, lines 55-67; col 2, lines 7-18). It would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute the normal radio frequency signal of Brunner with the extra high frequency millimeter band signal in order to fully utilize the continuous radio frequency spectrum to include higher microwave frequencies that has more industrial applicability to practical commercial purposes with the advantage of small output power and measuring of signals for reflective and radiation loss.

Brunner didn't specifically disclose wherein, in an obstructed state when the line of sight propagation path is obstructed, the receiver receives the signal through each of the plurality of propagation paths except the line of sight propagation path. Lewiner et al further discloses wherein, in an obstructed state when the line of sight propagation path is obstructed, the receiver 2 receives the signal through each of the plurality of propagation paths except the line of sight propagation path (see fig. 1 and hereafter; col 5, lines 13-16). It would have been obvious to one of ordinary skill in the art at the time the invention was made to receive via the indirect paths except the direct path in order to still be able to receive the signals even in severe multipath cases in which direct LOS path is not receivable.

Regarding claim 19, Brunner et al, Hayashikura et al, and Lewiner et al discloses the millimeter band signal transmitting/ receiving system of claim 18, wherein at least a

portion of the plurality of propagation paths are formed by at least one reflector (top ceiling) (fig. 2).

Regarding claim 20, Brunner et al, Hayashikura et al, and Lewiner et al the millimeter band signal transmitting/ receiving system of claim 19, wherein Brunner et al further discloses the at least one reflector (ceiling) has a surface arranged substantially parallel to the direct path 1(fig. 2).

Regarding claim 21, Hayashikura et al, and Lewiner et al Lewiner et al discloses the millimeter band signal transmitting/ receiving system of claim 19, wherein Brunner et al further discloses the at least one reflector includes two reflectors M (fig 1).

Regarding claim 22, Brunner et al, Hayashikura et al, and Lewiner et al the millimeter band signal transmitting/ receiving system of claim 21, wherein Lewiner et al further discloses at least one of the plurality of propagation paths from mobile 5 of the signal is formed by reflection from each of the two reflectors M (fig. 1).

Regarding claim 23, Brunner et al, Hayashikura et al, and Lewiner et al the millimeter band signal transmitting/ receiving system of claim 18, wherein Lewiner et al further discloses the at least one transmitter is a single transmitter 5.

1. Claims 24-26, 31-32, 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brunner et al (US 6,301,470) in view of Hayashikura et al in view of Lewiner et al (US 5,926,768) as applied to claim 18 above, and further in view of Kagami et al (US 5,479,443).

Regarding claim 24, Brunner et al, Hayashikura et al, and Lewiner et al discloses the millimeter band signal transmitting/ receiving system of claim 18, Brunner et al,

Hayashikura et al, and Lewiner et al didn't further disclose wherein the at least one transmitter includes two transmitters and two associated transmit antennas, wherein each of the two associated transmit antennas provides a separate line of sight propagation path to the receive antenna. Kagami et al further discloses wherein the at least one transmitter includes two transmitters and two associated transmit antennas, wherein each of the two associated transmit antennas provides a separate line of sight propagation path to the receive antenna (col 9, lines 37-48). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use two transmitters in order to assure that the signal can be transmitted via diversity transmission.

Regarding claim 25, Brunner et al, Hayashikura et al, and Lewiner et al discloses the millimeter band signal transmitting/receiving system of claim 24, wherein Kagami further discloses the two transmitters are further synchronized with each other (col 9, lines 37-48).

Regarding claim 26, Brunner et al, Hayashikura et al, and Lewiner et al discloses the millimeter band signal transmitting/ receiving system of claim 25, wherein Kagami et al further discloses the two transmitters share a common local oscillator (col 9, lines 37-48).

Regarding claim 31, Brunner et al, Hayashikura et al, and Lewiner et al the millimeter band signal transmitting/ receiving system of claim 18, wherein Brunner et al further discloses the receive antenna is a single receive antenna at 38.

Regarding claim 32, Brunner et al, Hayashikura et al, and Lewiner et al discloses the millimeter band signal transmitting/ receiving system of claim 18, wherein Brunner et al further discloses the receiver simultaneously receives the signal through each of an unobstructed direct plurality of propagation paths 1.

Regarding claim 34, Brunner et al, Hayashikura et al, and Lewiner et al discloses the millimeter band signal transmitting/receiving system of claim 1, wherein Lewiner et al further discloses the receiver receives the signal wave only through the at least one indirect path when the line of sight propagation path is blocked (col 5, lines 13-16). It would have been obvious to one of ordinary skill in the art at the time the invention was made to only receive indirect paths in order to allow the receiver to receive the signal even in severe multipath environments.

2. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Brunner et al (US 6,301,470) in view of Hayashikura et al (US 5,654,715) and further in view of Huibers et al (US 6,529,310).

Regarding claim 4, Brunner et al and Hayashikura et al discloses the millimeter band signal transmitting/receiving system according to claim 2, wherein Huibers et al further discloses the reflector has thin film including aluminum (col 5, lines 47-55; fig. 3b). Brunner et al and Hayashikura et al didn't disclose the thin film includes aluminum. Huibers et al discloses the thin film includes aluminum. However, it would have been obvious to one of ordinary skill in the art to apply or replace the material in the reflector of Brunner with any other kind of alternative materials such as metal, aluminum, etc. that is capable of reflecting the signals well without penetrating to reduce reflective loss.

3. Claims 5-6, and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brunner et al (US 6,301,470) in view of Hayashikura et al (US 5,654,715) and further in view of Freeburg (US 5,355,520).

Regarding claim 5, Brunner et al and Hayashikura et al discloses the millimeter band signal transmitting/receiving system according to claim 2, wherein Freeburg further discloses the reflector has a surface covered by an insulating material (col 3, lines 23-25; col 6, lines 1-24). It would have been obvious to one of ordinary skill in the art that the buildings or objects which are used as reflectors has insulating materials so that reflection can occur without signal absorption.

Regarding claim 6, Brunner et al and Hayashikura et al discloses the millimeter band signal transmitting/receiving system according to claim 2, wherein Freeburg further discloses the reflector has a surface covered by a transparent insulating material (col 6, lines 14-24). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the reflective surface to redirect the path of RF energy with little reflective loss.

Regarding claim 9, Brunner et al and Hayashikura et al discloses the millimeter band signal transmitting/receiving system according to claim 1, wherein Freeburg further discloses the receiver and the transmitter are provided inside a house, the propagation path includes a structural component defining an internal space of the house and reflecting a signal wave transmitted from the transmitter, and the transmitter is spaced by a prescribed distance from the structural component defining the internal space of the house for transmitting the signal wave with the millimeter band at a

prescribed transmission angle (col 3, lines 15-55). It would have been obvious to one of ordinary skill in the art at the time the invention was made to define an internal space, ie. inside a room in a building as in Freeburg for the transmitter and the receiver in order to transmit at closed range at a specific slant from the horizontal/vertical line.

4. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Freeburg et al and Brunner et al and Hayashikura et al as applied to claim 9 above, and further in view of Wax et al (US 6,249,680).

Regarding claim 10, Wax further discloses the millimeter band signal transmitting/receiving system according to claim 9, wherein each of the prescribed distance and the prescribed transmission angle is determined depending on a region for propagation of the plurality of signal waves and a positional relationship between the transmitter and the receiver (col 4, lines 65-67). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have a positional relationship in order to determine the accurate location of the transmitter.

5. Claim 15-17 and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Freeburg (US 5,355,520) in view of Brunner et al (US 6,301,470) and further in view of Hayashikura et al (US 5,654,715).

Regarding claim 15, Freeburg discloses a house provided with a signal transmitting/receiving system, comprising a structural component defining an internal space and a millimeter band signal transmitting/receiving system, wherein the signal

transmitting/receiving system includes a transmitter transmitting a signal wave with a millimeter band a propagation path forming portion arranged in the structural component for forming at least one propagation path for propagation of the signal (col 3, lines 15-55 and col 5, lines 9-20). Freeburg didn't further disclose a receiver simultaneously receiving a plurality of signal waves through a plurality of propagation paths including a line of sight propagation path and the at least indirect one propagation path. Brunner et al further discloses a receiver 30 (fig. 2) simultaneously receiving a plurality of signal waves through a plurality of propagation paths including a line of sight propagation path 1 directly to 30 to the transmitter and the at least indirect one propagation path 1 indirectly to 30 (col 5, lines 20-25; col 4, lines 56-65). It would have been obvious to one of ordinary skill in the art at the time the invention was made to simultaneously receive a plurality of signal waves provide simultaneous diversity reception at the receiver receive different multipath signals from different directions.

Brunner et al and Freeburg et al didn't disclose a millimeter band signal transmitting/receiving system, and a transmitter and receiver for transmitting and receiving a millimeter band signal wave. Hayashikura et al discloses a millimeter band signal transmitting/receiving system, and a transmitter and receiver for transmitting and receiving a millimeter band signal wave (col 2, lines 7-18; col 3, lines 60-67). It would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute the high frequency band signal of Brunner with the millimeter band signal in order to fully utilize the continuous spectrum by broadening the intended use of the

signal wave for frequencies that has more industrial applicability to practical commercial purposes depending on the available spectrum resource of the system.

Regarding claim 16, Freeburg, Brunner et al, and Hayashikura et al discloses a house provided with a millimeter band signal transmitting/receiving system according to claim 15, wherein the propagation path forming portion has a reflector reflecting an output from the transmitter and the reflector is arranged on a surface of the component (col 3, lines 35-55).

Regarding claim 17, Freeburg, Brunner et al, and Hayashikura et al discloses a house provided with a millimeter band signal transmitting/receiving system according to claim 15, wherein Freeburg further discloses the propagation path forming portion has a reflector 18 reflecting an output from the transmitter and the reflector is arranged inside the component (col 2, lines 30-35).

Regarding claim 36, Freeburg, Brunner et al, and Hayashikura et al discloses the house provided with a millimeter band signal transmitting/receiving system of claim 15, wherein Brunner et al further discloses the receiver 30 receives one of the plurality of signal waves through the line of sight 1 from directly to 30 propagation path when the line of sight propagation path is not blocked (fig. 2).

6. Claim 37 is rejected under 35 U.S.C. 103(a) as being unpatentable over Freeburg et al in view of Brunner et al in view of Hayashikura et al (US 5,654,715) as applied to claim 15 above and further in view of Lewiner et al (US 5,926,768).

Regarding claim 37, Lewiner et al further discloses the millimeter band signal transmitting/ receiving system of claim 15, wherein the receiver only receives the plurality of signal waves through the at least one indirect propagation path from when the line of sight propagation path is blocked (col 5, lines 13-16). It would have been obvious to one of ordinary skill in the art at the time the invention was made to receive only the indirect paths in severe multipath cases where the line of sight is hindered by some obstacles.

1. Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over Brunner et al in view of Lewiner et al in view of Hayashikura et al (US 5,654,715) as applied to claim 18 above, and further in view of Freeburg et al (US 5,355,520).

Regarding claim 30, Brunner et al, Lewiner et al and Hayashikura et al discloses the millimeter band signal transmitting/ receiving system of claim 18, wherein Freeburg further discloses a portion of the plurality of propagation paths are formed by interaction with a structural component of a building (fig. 3). It would have been obvious to one of ordinary skill in the art at the time the invention was made to interact with a building in order for the signals to propagate within closed range inside a predefined space.

2. Claims 12-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brunner et al in view of Hayashikura et al (US 5,654,715) and further in view of Kagami (US 5,479,443).

Regarding claim 12, Brunner et al and Hayashikura et al discloses the millimeter band signal transmitting/receiving system according to claim 11, wherein Kagami further

discloses wherein each of the plurality of transmitters includes a local oscillator oscillating at a prescribed local oscillator frequency for generating the signal wave at the same frequency (col 9, lines 25-36). It would have been obvious to one of ordinary skill in the art at the time the invention was made for two transmitters to have a common frequency via a common local oscillator in order to convert the reference frequency to the desired frequency band signal.

Regarding claim 13, Brunner et al and Hayashikura et al discloses the millimeter band signal transmitting/receiving system according to claim 11, wherein Kagami further discloses the local oscillators are in synchronization with each other. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have a common oscillator that are synchronized to generate the same frequency for the transmitters to generate two signals.

11. Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Brunner et al in view of Hayashikura et al (US 5,654,715) and Lewiner et al as applied to claim 18 above, and further in view of Evans et al (US 5,920,813).

Regarding claim 27, Lewiner, Brunner et al, and Hayashikura et al discloses the millimeter band signal transmitting/ receiving system of claim 18, wherein Evans et al further discloses the signal is a video signal (col 4, lines 65- col 5, line 2; col 8, lines 13-20). It would have been obvious to one of ordinary skill in the art at the time the invention was made to add the video signals in order to apply the higher microwave frequencies to practical use.

12. Claims 28-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brunner et al and Lewiner et al in view of Hayashikura et al and further in view of Keskitalo et al (US 6,128,486).

Regarding claim 28, Brunner et al, Lewiner et al and Hayashikura et al discloses the millimeter band signal transmitting/ receiving system of claim 18, wherein Keskitalo further discloses the line of sight propagation path between the associated transmit antenna and the receive antenna is formed in a side lobe B of the associated transmit antenna. It would have been obvious to one of ordinary skill in the art at the time the invention was made to add a side lobe to signal the incoming beam direction of the signal from the transmitter.

Regarding claim 29, Brunner et al, Lewiner et al and Hayashikura et al discloses the millimeter band signal transmitting/ receiving system of claim 18, wherein Keskitalo further discloses the plurality of propagation paths of the signal except the line of sight propagation path are formed in a main lobe A (fig. 3) of the associated transmit antenna. It would have been obvious to one of ordinary skill in the art at the time the invention was made to receive indirect signals via a separate lobe than the line of sight path in order to distinguish from what direction the signal is coming from.

13. Claims 38-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brunner et al in view of Hayashikura et al and further in view of Keskitalo et al (US 6,128,486).

Regarding claim 38, Brunner et al and Hayashikura et al discloses the millimeter band signal transmitting/ receiving system of claim 1, wherein Keskitalo et al further

discloses the at least one indirect propagation path is formed in a main lobe A (fig. 3) of a transmit antenna. It would have been obvious to one of ordinary skill in the art at the time the invention was made to receive indirect signals via a separate lobe than the line of sight path in order to distinguish from what direction the signal is coming from.

Regarding claim 39, Brunner et al and Hayashikura et al discloses Keskitalo et al discloses the millimeter band signal transmitting/ receiving system of claim 1, wherein Keskitalo et al further discloses the line of sight propagation path is formed in a side lobe B of a transmit antenna (fig. 3). It would have been obvious to one of ordinary skill in the art at the time the invention was made to add a side lobe to signal the incoming beam direction of the signal from the transmitter.

14. Claim 40 is rejected under 35 U.S.C. 103(a) as being unpatentable over Freeburg et al (US 5,355,520) and Brunner et al and Hayashikura et al and further in view of Keskitalo et al (US 6,128,486).

Regarding claim 40, Brunner et al, Freeburg et al and Hayashikura et al discloses the millimeter band signal transmitting/ receiving system of claim 15, wherein Keskitalo et al further discloses the line of sight propagation path is formed in a side lobe B of a transmit antenna (fig. 5). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have a beam lobe to signal the incoming beam direction of the signal from the transmitter.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lana Le whose telephone number is (703) 308-5836. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Daniel Hunter can be reached on (703) 308-6732. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9314 for regular communications and (703) 872-9315 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-4750.

Lana Le

March 7, 2003

THANH CONG LE
PRIMARY EXAMINER 8/10/03